U.S. EPA Superfund Fact Sheet
City of Perryton Well No. 2
Proposed Plan

Perryton, Texas

July 31, 2002

EPA PROPOSES FINAL REMEDY FOR WELL NO. 2

In this Proposed Plan, the U.S. Environmental Protection Agency (EPA) describes a proposed final remedy for the City of Perryton Well No. 2 Superfund site (Site) and provides the rationale for this preference. In addition, this Proposed Plan includes summaries of other alternatives evaluated for use at this Site. This document is issued by the U.S. Environmental Protection Agency (EPA), the lead agency for Site activities, and the Texas Natural Resource Conservation Commission (TNRCC), the support agency. The EPA, in consultation with the TNRCC, will select a final remedy for the Site after reviewing and considering all information submitted during the 30-day public comment period. The EPA, in consultation with the TNRCC, may modify the proposed remedy or select another response action presented in this Proposed Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on all the alternatives presented in this Proposed Plan. The Feasibility Study report for this Site should be consulted for more detailed information on these alternatives.

The EPA is issuing this Proposed Plan as part of its public participation responsibilities under section 117(a) of the Comprehensive Environmental, Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and to the extent practicable, §300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This Proposed Plan summarizes information that can be found in greater detail in the Remedial Investigation and Feasibility Study reports and other documents contained in the Administrative Record file for this Site. The EPA and TNRCC encourage the public to review these documents to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted at the Site.

The Administrative Record file, which contains the information on which the selection of the interim response action will be based, is available at the following locations:

Perry Memorial Library
22 S.E. 5th Street
Perryton, TX 79070-3112
(806) 435-5801
Monday, 9:30 a.m. to 8:00 p.m.
Tuesday - Friday, 9:30 a.m. - 5:30 p.m.
Saturday, 9:30 a.m. - 1:00 p.m.

U.S. Environmental Protection Agency Region 6
Seventh Floor Reception Area
1445 Ross Avenue, Ste. 12D13
Dallas, Texas 75202-2733
(214) 665-2792
Monday - Friday, 7:30 a.m. to 4:30 p.m.

Texas Natural Resource Conservation Commission
Records Management, Room 190, Building D
12100 Park 35 Circle
Austin, Texas 78711-3087,
(512) 239-2920
Monday - Friday, 8:00 a.m. to 5:00 p.m.

COMMUNITY PARTICIPATION

The public is invited to comment on the Remedial Investigation and Feasibility Study (RI/FS) reports and Proposed Plan for the Site. The public comment period begins on July 31, 2002, and ends on August 30, 2002. During the public comment period, written comments may be submitted to the following address or via e-mail to malott.vincent@epa.gov.

To receive a Spanish translation of this fact sheet call U.S. EPA at 1-800-533-3508.

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Para recibir una traducción en español de esta hoja de datos, comunicarse con la Agencia de Protección del Medio Ambiente de los EEUU (la EPA) al número de teléfono 1-800-533-3508.

Vincent Malott
Remedial Project Manager
U.S. EPA (6SF-AP)
1445 Ross Avenue
Dallas, Texas 75202-2733

Additionally, oral comments will be accepted at a public meeting scheduled for August 14, 2002, beginning at 7:00 p.m., at City Hall, in Perryton, Texas. This meeting is being held in a fully accessible facility. Should you have specific needs or questions about the facility or transportation, please contact Vincent Malott at 1-800-533-3508 (toll free).

The EPA will respond to all comments on this Proposed Plan received during the public comment period in a document called a Responsiveness Summary. The Responsiveness Summary will be attached to the Record of Decision (ROD) for this Site and made available to the public in the information repositories. The ROD explains the remedial action selected for implementation at this Site. The remedy may be different from the preferred alternative identified in this Proposed Plan based on comments, new information, or issues received during the public comment period. Any aspects of the proposed action that are significantly different from the Proposed Plan will be explained in the ROD. The ROD will be signed by the Regional Administrator for EPA Region 6.

Information about the public involvement process and answers to questions about activities at the Site can obtained from the following:

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malott.vincent@epa.gov

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Texas Natural Resource Conservation Commission
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Susan L. Prosperie
Texas Department of Health
1100 West 49th Street
Austin, Texas 78756
(512) 458-7269

Media inquiries should be directed to Mr. Dave Bary, EPA Region 6 Press Officer, at (214) 665-2208.

On the Web

Additional information about the Perryton Well No. 2 Superfund site also can be found on the Internet at ***www.epa.gov/region6/superfund.***

Information about the Agency for Toxic Substances and Disease Registry (ATSDR) can be found at ***www.atsdr.cdc.gov***. The website for the Texas Department of Health is ***www.tdh.state.tx.us***.

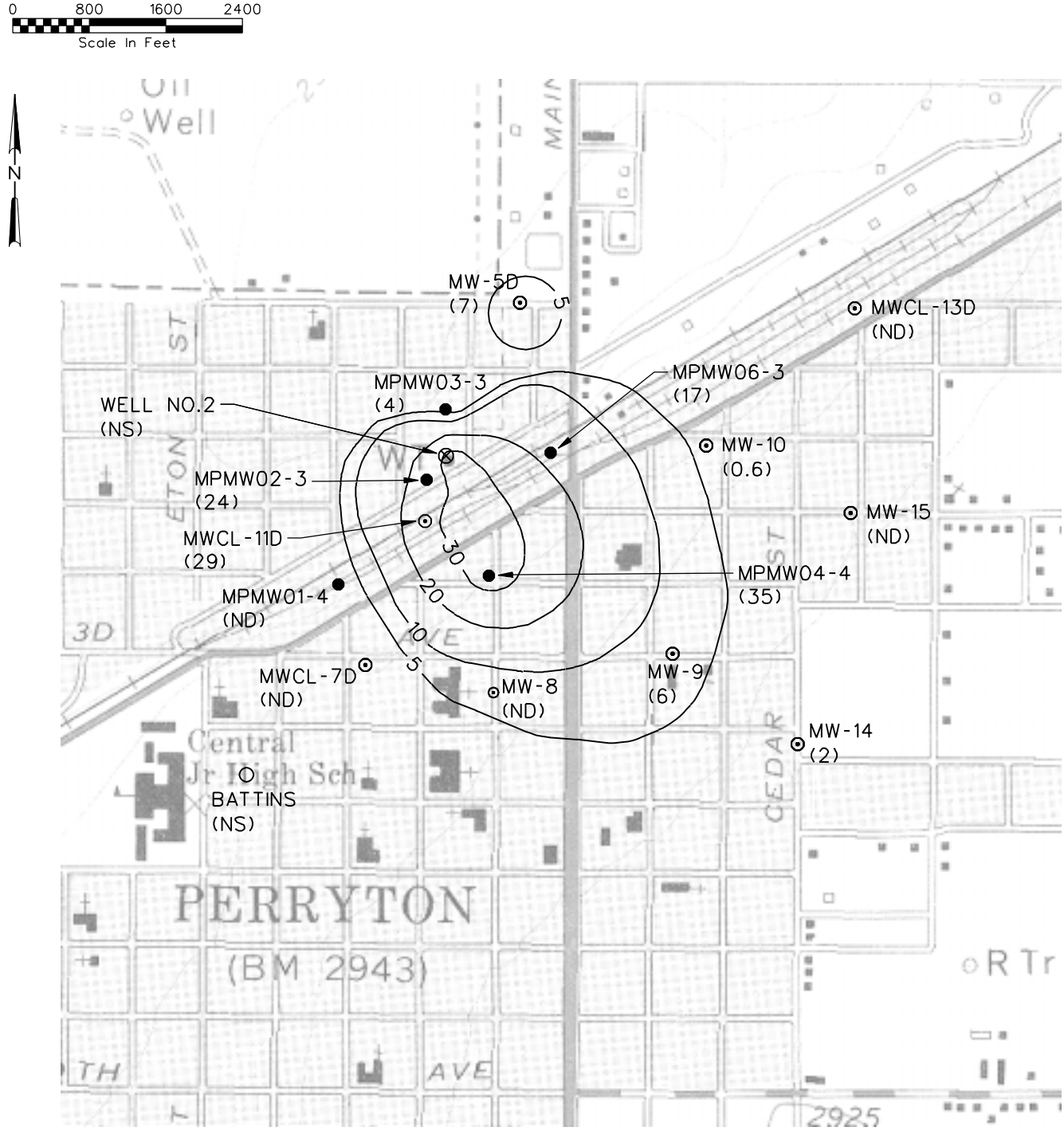
SITE BACKGROUND AND DESCRIPTION

The City of Perryton Well No. 2 Superfund Site is located in Perryton, Ochiltree County, Texas, in the northernmost part of the Texas panhandle. Perryton is currently served by 10 municipal supply wells completed in the Ogallala aquifer which distributes water into two water systems. The northern public water system consists of Well Nos. 1 and 2 (inactive) that serve the portion of town north of the Southwestern Railroad tracks. Well No. 1 is located approximately 0.3 miles north of the Well No. 2. The southern public water system consists of Well Nos. 3 through 11 which serve the larger portion of the town south of the railroad tracks. Both water systems pump to separate water storage tanks where chlorine is added and the water is distributed to city customers. The northern water system has 500 connections and serves approximately 1,140 people, while the southern supply system serves approximately 6,500 people.

Well No. 2 is located on a 1.7-acre, city-owned maintenance yard used by the City of Perryton Utility Department at the intersection at North Amherst Street and Santa Fe Avenue **(Figure 1)**. A 75,000-gallon elevated steel storage tank is directly south of the well. The city property is bordered to the south by the Southwestern Railroad tracks and the Perryton Equity Exchange which is a grain storage facility. An electrical substation is located east of the Site. The Southwestern Electric Public Supply borders the city property to the north and private residences are present west of the Site.

Well No. 2 was constructed in 1946 to a total depth of 420 feet. The well is constructed of 16 inch casing and is screened from 330 feet to 415 feet. The annular space between the casing and borehole is filled with gravel from the base of the well to approximately 15 feet below ground surface. A cement grout seal was placed from 15 feet to ground surface with a 6 foot by 6 foot concrete pad at the surface.

Well No. 2 has been out of service since May 1989 when the Texas Department of Health (TDH) originally documented carbon tetrachloride (CTC) contamination. The City of Perryton began participation in the Texas Water



LOWER ZONE

LEGEND

○	DOMESTIC/INDUSTRIAL/IRRIGATION WELL
⊙	MONITOR WELL
●	MULTI-PORT MONITOR WELL
⊗	MUNICIPAL WELL
NS	NOT SAMPLED
ND	NOT DETECTED

FIGURE 1
CONTOURED EXTENT OF CARBON TETRACHLORIDE
IN GROUNDWATER
OCTOBER 2000
CITY OF PERRYTON WELL NO. 2 SITE FEASIBILITY STUDY
PERRYTON, TEXAS

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Commission (predecessor to the Texas Natural Resource Conservation Commission) Wellhead Protection Program in 1988. In early 1989, the City of Perryton requested volatile organic chemical analyses of its system after the Wellhead Protection Program was put in place. The initial sample by the TDH in 1989 indicated a concentration of benzene at 1 microgram per liter (µg/L) in the northern supply system. The two wells that serve the northern supply system, Well Nos. 1 and No. 2, and the 75,000 gallon storage tank were re-sampled on May 9, 1989. Well No. 1 was found to have no contamination; however, Well No. 2 was found to have 25 µg/L carbon tetrachloride and 1 µg/L chloroform. The storage tank was found to contain 11 µg/L carbon tetrachloride and was immediately flushed and rinsed. Well No. 2 was taken out of service at that time. The carbon tetrachloride concentration exceeds the Maximum Contaminant Level (MCL) of 5 µg/L established under the Federal Safe Drinking Water Act. Additional samples collected from Well No. 2 by the TDH and Texas Water Commission in 1989 and 1990 documented carbon tetrachloride levels ranging from 9 µg/L to 40 µg/L. Chloroform was also found at levels ranging from less than 1 µg/L to 3.1 µg/L. The chloroform concentrations did not exceed the MCL of 100 µg/L.

The EPA conducted a limited site investigation in 1996 as part of the site assessment process. Carbon tetrachloride concentrations in Well No. 2 were present as high as 50.3 µg/L. While potential sources were investigated during the limited site investigation, no sources were identified that could be definitively attributed to the hazardous substances found in Well No. 2. Analysis of ground water samples collected from City of Perryton municipal supply wells No. 1 and Nos. 3 through 11 indicate that the ground water being pumped by those wells has not been affected by the contamination present in Well No. 2.

On September 29, 1998, EPA proposed the Site to the National Priorities List (NPL) of Superfund sites (63 Fed. Reg. 188, September 29, 1998). The Site was placed on the Superfund NPL on February 18, 1999 (64 Fed. Reg. 11, January 19, 1999). The EPA issued an Interim Record of Decision in September 1999 for the installation of an air stripper at the Well No. 2 Site to remove carbon tetrachloride and provide limited control on further contaminant migration. The treated water can then be used by the City of Perryton to supplement the northern water supply system.

Construction of the air stripper treatment plant began in November 2001 and was completed in February 2002. A 30-day test period to evaluate the system has been completed, and the test results demonstrate the system is effective in removing carbon tetrachloride to non-detect concentrations. Full-time operation of the air stripper treatment plant will begin following a review period of the test results by the TNRCC drinking water program.

SUMMARY OF SITE CHARACTERISTICS

The EPA completed the Remedial Investigation (RI) report in July 2001 documenting the results of an investigation into potential sources of contamination and the extent of contamination in the ground water. The RI field activities included multi-port ground water monitor well installations, ground water sampling, and aquifer testing. Eighteen ground water monitor wells were installed at 14 separate locations (well pairs at different depths were installed at four of the locations). **Figure 1** shows the locations of all new and existing ground water wells (including private supply wells) near the Site.

The Ogallala aquifer supplies the drinking water for Perryton as well as water for irrigation and other agricultural use in the surrounding areas. The water table is present at a depth of 265 feet and the aquifer is confined at the base by silts and clays of the Whitehorse Formation. A vertical gradient has developed in the aquifer in response to increased demand with a drop of 20 feet in the water table since 1981 and an average loss of 2 feet per year within the last 5 years. Principal production occurs in the lower units of the Ogallala which act as a confined aquifer. Ground water flow velocity within the production zone is approximately 125 feet per year.

Ground water samples were collected in February, June, and October 2000. CTC and nitrate are the primary contaminants detected in the ground water and maximum concentrations are localized around Well No. 2 and the adjacent Perryton Equity Exchange silos. The CTC is present in the principal production zone and has migrated laterally to the southeast approximately ½ mile from the Site (**Figure 1**). Contaminant migration is consistent with the regional flow direction in the aquifer. The maximum detected CTC concentration is 64 parts per billion (ppb) in monitoring well No. 11S located midway between the Perryton Equity Exchange and Perryton Well No. 2. This contamination is contained within a perched zone above the principal production zones. Within the production zones, maximum concentrations range from 29 to 35 ppb west of Main Street. In monitoring wells east of Main Street, the CTC concentrations decrease and range from non-detect to 6 ppb. Similar nitrate concentrations are observed in the area with maximum concentrations over 20 mg/L west of Main Street with a decrease to background levels east of Main Street.

Soil vapor samples were collected between November 1999 and April 2000 from ten soil vapor well clusters. The sample results were used to evaluate whether a source of the contamination remained in the unsaturated soils that may continue to migrate downward to the water table at 265 feet. Each well nest consists of five wells screened at varying intervals in the unsaturated zone. Based on the available information, potential source areas were targeted at the nearby Perryton Equity Exchange and Perryton maintenance

yard. The highest CTC concentrations were observed in two of the six well clusters installed adjacent to current or former grain silos at the Perryton Equity Exchange. CTC concentrations between 7 and 57 ppb were found at depths ranging from 70 to 250 feet indicating a possible source for the CTC present in the ground water. Similar CTC concentrations were not present in nearby wells indicating a localized source area. While the silos are a likely source area, the remaining soil gas concentrations are no longer a significant contributor to the ground water contamination.

The source of the elevated nitrate levels in the ground water are likely the result of leaking sanitary sewers near Well No. 2 based on a geochemical evaluation of the nitrate isotopes by the United States Geological Survey (USGS). The specific nitrate isotopes from ground water samples collected in June 2000 are linked to nitrates from sewer systems rather than fertilizers. Based on this information, the City of Perryton investigated the condition of the sewer lines within the Site in 2001 and repaired those damaged lines in with a new liner system in February 2002 to prevent further releases. Nitrates have not been detected above background levels in the other city municipal wells.

SCOPE AND ROLE OF RESPONSE ACTION

This response action is the final site remedy and is intended to address fully the threats to human health and the environment posed by the conditions at this Site. The interim remedial action addressed the treatment of water pumped from Well No. 2 as a means to provide a limited control of the contaminant plume. The purpose of this response action is to implement a site-wide strategy for preventing or minimizing further migration of the contaminant plume and returning ground water to its expected beneficial use.

SUMMARY OF SITE RISKS

A human health risk screening evaluation was completed for the RI report using analytical results from eight monitor wells that occur within or near the suspected source area for ground water contamination encountered at the Well No. 2 site. CTC, chloroform, atrazine, and nitrate were selected as the contaminants of concern (COC) for the risk screening evaluation. Propazine was not selected as a COC because the reported concentrations did not exceed risk levels. Carcinogenic (estimated lifetime cancer risk [ELCR]) and noncarcinogenic (hazard index [HI]) risk estimates were calculated for the following exposure scenarios: a reasonable maximum exposure (RME) for both a residential adult and child; and, a worst-case exposure scenario using the maximum detected concentration for both a residential adult and child.

Under the residential adult age-adjusted and child RME scenarios, the cumulative ELCR for all carcinogenic COPCs is $1x10^{-4}$ and $4x10^{-5}$, respectively. The noncarcinogenic HI is 5.6 and 10.4 for the adult age-adjusted and child RME scenarios, respectively. Under the residential adult age-adjusted and child worst-case exposure scenarios, the cumulative ELCR for all carcinogenic COPCs is $7x10^{-4}$ and $2x10^{-4}$, respectively. The HI is 33 and 15, for residential adult age-adjusted and child worst-case scenarios, respectively. The primary contributor to carcinogenic and noncarcinogenic risk is CTC.

A number of adverse health effects result from exposure to carbon tetrachloride, nitrate, and atrazine. According to information provided by the Agency for Toxic Substances and Disease Registry (ATSDR), exposure to high concentrations of carbon tetrachloride can cause liver, kidney, and central nervous system damage. Carbon tetrachloride is also classified as a probable (B2) carcinogen based upon animal studies. The ATSDR is the Federal agency created under the Superfund Act charged with taking responsive public health actions to prevent harmful exposures and disease related to toxic substances. At this Site, the ATSDR is working in close collaboration with the Texas Department of Health. The goal of the Agency is to help prevent or reduce the harmful effects of exposure to hazardous substances on human health.

Nitrate is a primary source of nitrogen for plants and is a compound found in nature. Nitrates are also commonly found in fertilizers, animal wastes, and sewage. Infants under six months of age are the most affected by excess nitrates in the water or in formula made from the water and may develop a condition known as methemoglobenemia (commonly called “blue baby syndrome”). Infants have bacteria in their stomachs which convert nitrate to nitrite. The primary toxic effect of nitrite is from absorption into the blood which prevents hemoglobin (red oxygen-carrying blood pigment) from releasing the oxygen. Between the age of 3 months and 6 months, the infant’s body naturally begins to increase the amount of stomach acid which kills most of these bacteria. After 6 months, the infant’s risk for methemoglobenemia decreases.

Atrazine has been classified as a “Restricted Use Pesticide” because of its potential for ground water contamination. Atrazine has been used as a herbicide for controlling broadleaf and grassy weeds in a variety of crops. The EPA has found atrazine to potentially cause the following health effects when people are exposed to it at levels above the MCL for relatively short periods of time: congestion of heart, lungs and kidneys; low blood pressure; muscle spasms; weight loss; and damage to adrenal glands.

Actual or threatened releases of hazardous substances from this Site, if not addressed by the preferred alternative or one of the other alternatives considered, may present a current or potential threat to public health, welfare, or the environment.

PRELIMINARY REMEDIAL ACTION OBJECTIVES

The Preliminary Remedial Action Objectives for this site-wide remedial action are consistent with the Interim ROD and are expanded to include: (1) minimize further migration of the ground water contamination; and (2) return ground water to the expected beneficial use wherever practicable. While there is no current exposure to contaminated ground water above acceptable risk levels, monitoring of the ground water and treatment plant operations would be necessary to ensure site conditions do not change resulting in exposure to contaminated ground water that is above acceptable risk levels.

The Remedial Goals established in the 1999 Interim ROD for chemicals of concern in ground water are based on the MCL established under the Safe Drinking Water Act. The Remedial Goals include: Carbon Tetrachloride - 5µg/L; Chloroform - 100 µg/L; Nitrate - 10,000 µg/L; and Atrazine - 3 µg/L.

SUMMARY OF REMEDIAL ALTERNATIVES

Alternative 1: No Further Action
Estimated Capital Cost: $0
Estimated ASTP Annual O&M Costs: $53,236
Estimated Present Worth (7%): $660,606

The No Further Action alternative includes only the continued operation of the air stripper treatment plant (ASTP) built at the Well No. 2 location. No Further Action is considered in this evaluation as a baseline for comparison to all other potential remedial actions, as required by the NCP. The intermittent operation of Well No. 2 at a rate of 140 gallons per minute (g.p.m.) (equivalent to 65 g.p.m. full-time) will not capture all of the contaminant source area (**Figure 2**). The existing treatment system easily removes the CTC from the pumped ground water prior to discharge into the North Ground Storage Tank (NGST). The volume and rate of pumping is limited to ensure the nitrate concentrations do not exceed 7 milligrams per liter (mg/L) in the blended water. The existing ground water contaminant plume would be allowed to continue migrating with dilution acting to reduce concentrations. No long-term ground water monitoring would be performed to evaluate the plume migration. The time to implement this remedy is not significant since the ASTP would continue to operate unchanged.

Alternative 2: No Further Action, with Long-Term Monitoring
Estimated Capital Cost: $177,000
Estimated ASTP Annual O&M Costs: $53,236
Estimated Annual Monitoring Costs: $58,000 - $219,000
Estimated Present Worth (7%): $2,049,000

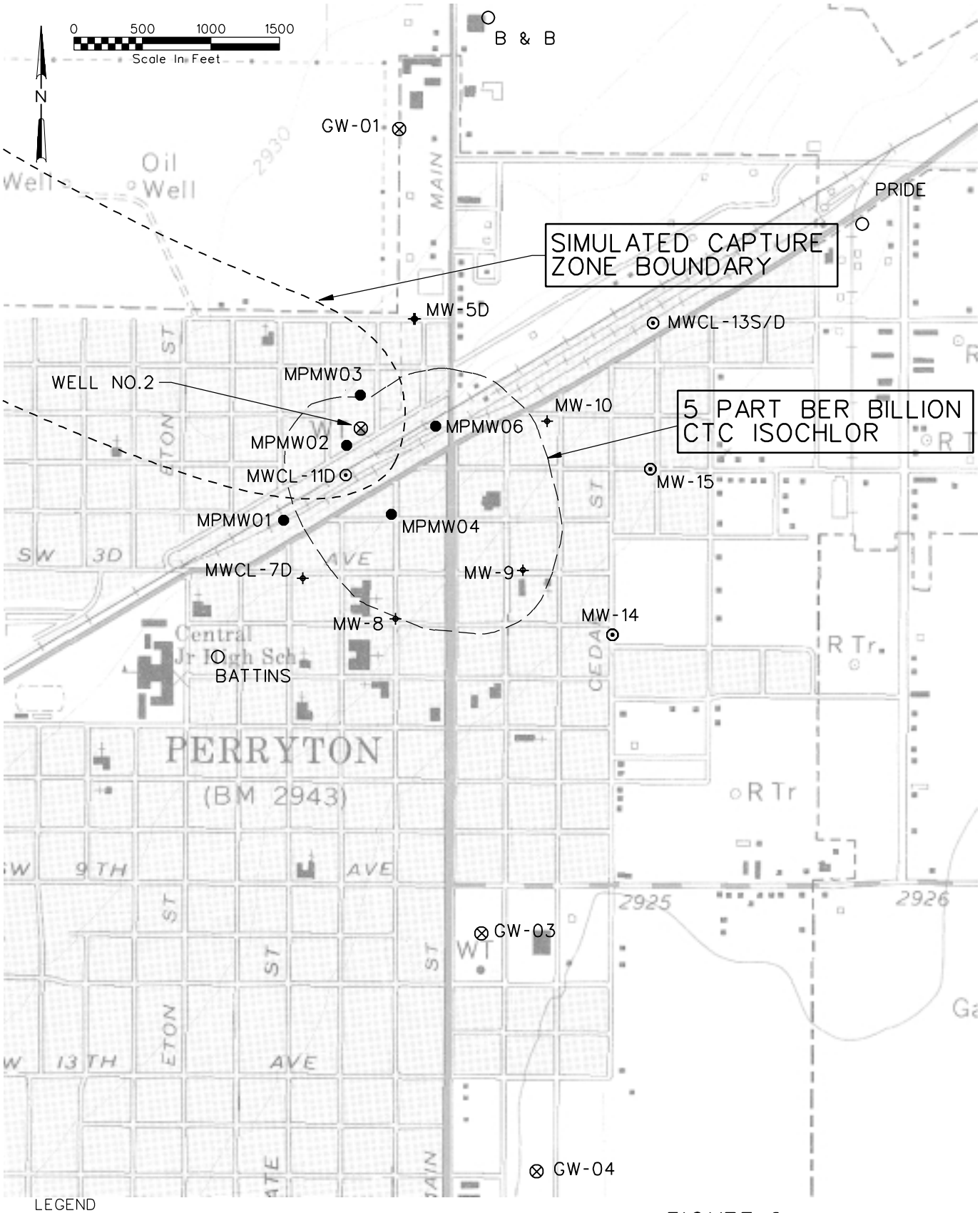
This alternative is identical to Alternative 1 with the addition of a long-term ground water monitoring program to track the contaminant migration and changes in concentration (**Figure 2**). The costs for additional monitoring wells are included in the monitoring program. The time to implement this remedy is not significant since the ASTP would continue to operate unchanged and only three additional monitoring well locations are proposed for installation. The ground water contamination is predicted to remain above the cleanup standards for at least 30 years.

Alternative 3: Expanded Operation of Well No. 2 with Long-Term Monitoring
Estimated Capital Cost/O&M Cost:
Option 1: $954,274/$51,890
Option 2: $722,842/$9,397
Option 3: $558,367/$12,588

Estimated ASTP Annual O&M Costs: $61,603
Estimated Annual Monitoring Costs: $58,000 - $219,000
Estimated Present Worth (7%):
Option 1: $3,751,930
Option 2: $2,993,200
Option 3: $2,868,327

Alternative 3 includes the long-term monitoring elements of Alternative 2 and continuous operation of Well No. 2 at a higher rate of 120 g.p.m. to capture the source area (**Figure 3**). The expanded capture zone in Alternative 3 would address all of the high CTC and nitrate concentrations in the ground water beneath the silos and surrounding Well No. 2. The ground water contamination east of Main St. would be unaffected by the higher pumping rate but would be monitored to track the extent of migration. The CTC downgradient of the capture zone would persist for an estimated 30 years but is not predicted to impact any existing water supply well. The existing treatment system can easily remove the CTC from this volume of water but will not address the nitrate contamination. For this alternative, the higher flow rates of treated water will need to undergo further treatment with ion exchange to remove the nitrate (Option 1) for use in the NGST; be diverted to the higher capacity South Ground Storage Tank (SGST) via a pipeline (Option 2) for blending with water from other wells; or be diverted to the sanitary sewer system for eventual discharge to an additional wastewater lagoon constructed south of Perryton to handle the excess flow (Option 3). The time to implement this remedy is expected to be 6 months.

Alternative 4: Expanded Operation of Well No. 2 with Additional Extraction Well and Long-Term Monitoring
Estimated Capital Cost/O&M Cost:
Option 1: $1,994,856/$139,886
Option 2: $907,511/$41,000
Option 3: $1,109,6255/$64,946
Estimated ASTP Annual O&M Costs: $61,603
Estimated Annual Monitoring Costs: $58,000 - $219,000
Estimated Present Worth (7%):
Option 1: $5,588,765

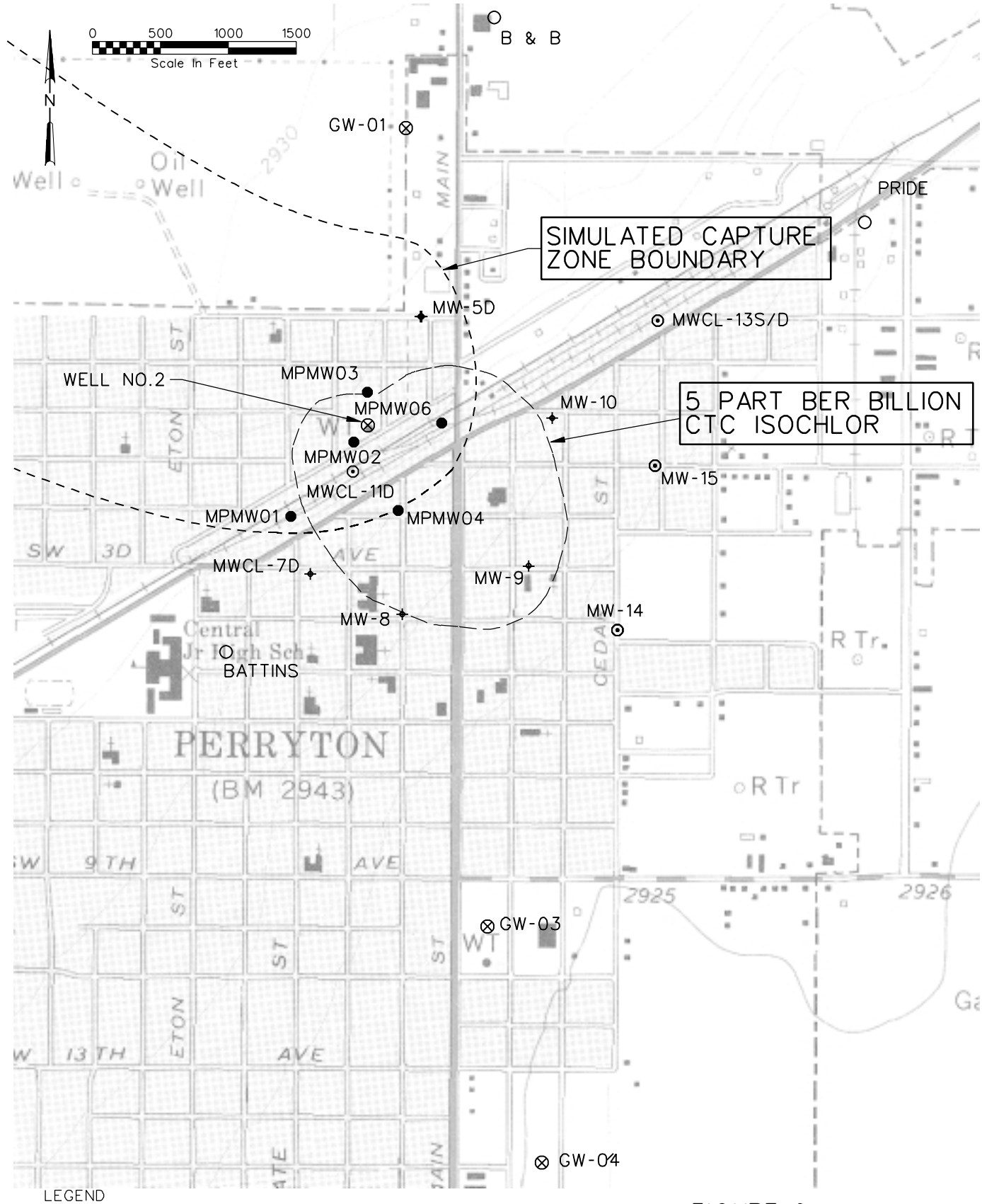


LEGEND

- ⊙ MONITOR WELL
- ● MULTI-PORT MONITOR WELL
- ⊗ MUNICIPAL WELL
- + OBSERVATION WELL
- ○ DOMESTIC/INDUSTRIAL/IRRIGATION WELL

54015F178.DGN WELL NO'S. 3 & 4 OPERATING

FIGURE 2
ALTERNATIVES 1 & 2
OUTLINE OF WELL NO.2 CAPTURE ZONE AT 65 gpm - PREDICTIVE RATES
CITY OF PERRYTON WELL NO. 2 SITE RI/FS
PERRYTON, TEXAS



LEGEND

- ⊙ MONITOR WELL
- ● MULTI-PORT MONITOR WELL
- ⊗ MUNICIPAL WELL
- ⌖ OBSERVATION WELL
- ○ DOMESTIC/INDUSTRIAL/IRRIGATION WELL

54015F179.DGN WELL NO'S. 3 & 4 OPERATING

FIGURE 3
ALTERNATIVE 3
OUTLINE OF WELL NO. 2 CAPTURE ZONE
AT 120 gpm - PREDICTIVE RATES
CITY OF PERRYTON WELL NO. 2 SITE RI/FS
PERRYTON, TEXAS

Option 2: $3,439,856
Option 3: $3,939,115

Alternative 4 includes all of the elements of Alternative 3 plus the installation of a second extraction well pumping at 120 g.p.m. to capture a larger area of the ground water contamination. The combined pumping rate of 240 g.p.m. would created an expanded capture zone to address all of the high CTC and nitrate concentrations in the ground water beneath the silos and surrounding Well No. 2 as well as most of the contamination east of Main Street (**Figure 4**). Any contamination unaffected by the pumping wells is expected to dissipate within 10 years. Operation of the second pumping well is expected to be completed within 10 years as the CTC contamination is reduced to an area surrounding Well No. 2. Ground water contamination in the source area may persist for 20 years or more. The existing treatment system can easily remove the CTC from this volume of water but will not address the nitrate contamination. For this alternative, the higher flow rates of treated water will need to undergo further treatment with ion exchange to remove the nitrate (Option 1) for use in the NGST and the excess volume would be disposed into an injection well installed outside the plume boundary; be diverted to the higher capacity SGST via a pipeline (Option 2) for blending with water from other wells; or be diverted to the sanitary sewer system for eventual discharge to an additional wastewater lagoon constructed south of Perryton to handle the excess flow (Option 3). The time to implement this remedy is expected to be 6 months.

EVALUATION OF ALTERNATIVES

Nine criteria are used to evaluate the different remediation alternatives individually and against each other in order to select a remedy. The nine evaluation criteria are (1) overall protection of human health and the environment; (2) compliance with ARARs; (3) long-term effectiveness and permanence; 4) reduction of toxicity, mobility, or volume of contaminants through treatment; (5) short-term effectiveness; (6) implement ability; (7) cost; (8) State/support agency acceptance; and (9) community acceptance. This section of the Proposed Plan profiles the relative performance of each alternative against the nine criteria, noting how it compares to the other options under consideration. The nine evaluation criteria are discussed below. The "Detailed Analysis of Alternatives" can be found in the FS.

1. **Overall Protection of Human Health and the Environment** *determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.*

Alternative 1, implemented as an interim remedy to begin control of the contaminant plume, is not intended to address fully the threats to human health posed by the conditions at this Site. Alternatives 2 - 4, which also utilize the treatment plant, are protective of human health through an additional ground water monitoring program which would provide early warning of any potential exposure to ground water contaminants. Since Alternatives 3 and 4 achieve the greatest reduction in plume size, these alternatives are better at maintaining protection of human health since the potential exposure area is reduced.

2. **Compliance with ARARs** *evaluates whether the alternative meets Federal and State environmental statutes, regulations, and other requirements that pertain to the Site or whether a waiver is justified.*

All of the alternatives would meet their respective ARARS from Federal and State laws. The calculated air emissions from the air stripper are below the State standards.

3. **Long-term Effectiveness and Permanence** *considers the ability of an alternative to maintain protection of human health and the environment over time*.

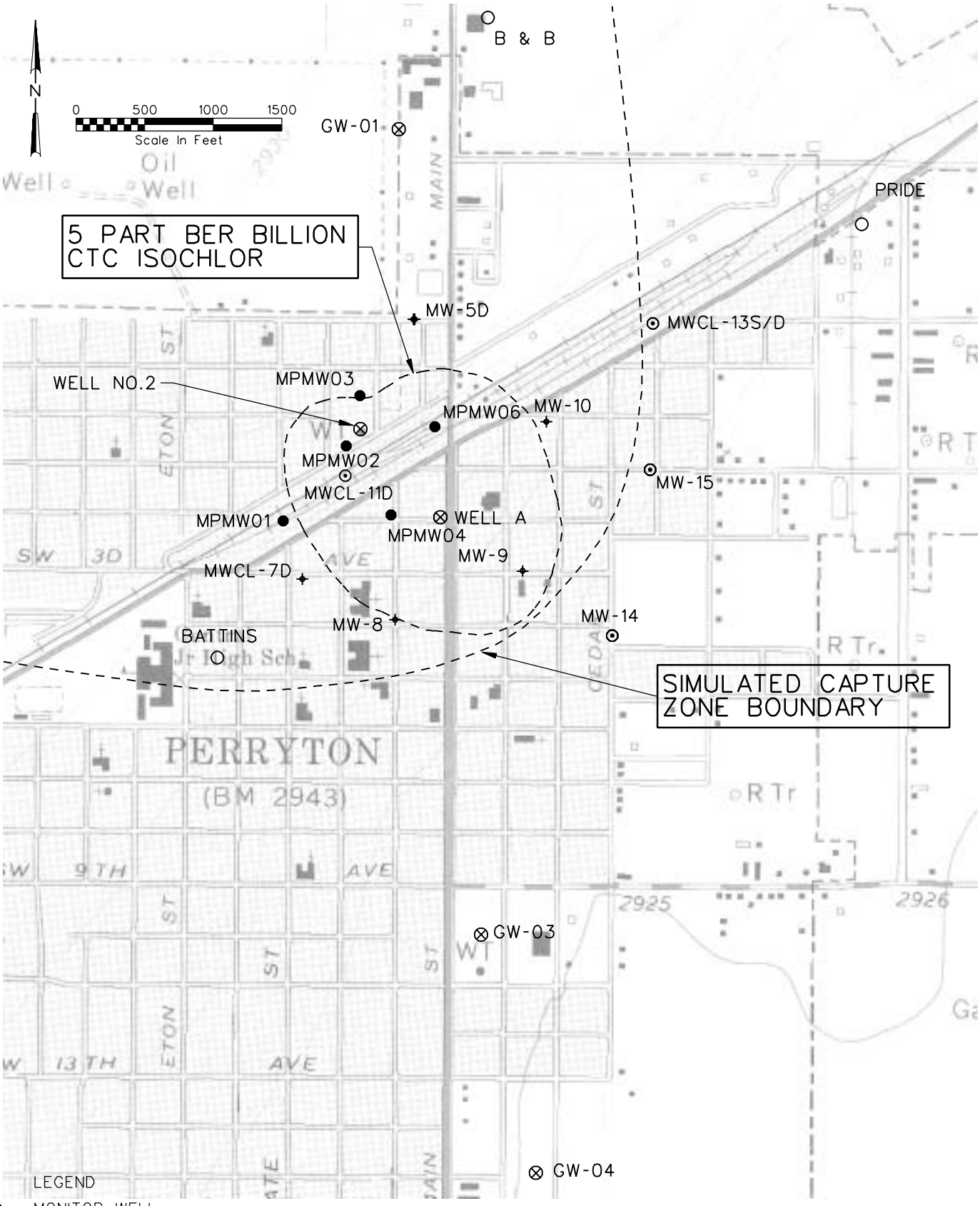
Alternatives 2 - 4 achieve equal long-term effectiveness through the use of a monitoring well network to evaluate the migration or reduction in the size of the contaminant plume. City zoning restrictions on new well installations and the monitoring well network would provide early warning on any potential exposure to ground water contaminants. Since Alternatives 3 and 4 achieve the greatest reduction in plume size, these alternatives are better at maintaining protection of human health since the potential exposure area is reduced.

4. **Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment** *evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.*

All of the alternatives utilize the air stripper to remove the CTC from the ground water and thus satisfy the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element. Alternative 4 achieves the maximum reduction of contaminants through treatment because it pumps the greatest volume of water from the aquifer for treatment amongst all of the alternatives.

5. **Short-term Effectiveness** *considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.*

Since Alternatives 1 and 2 utilize the existing treatment system and monitoring well network, the systems are essentially functional without further modification. For Alternatives 3 and 4, the length of time needed for construction of any additional treatment systems or the discharge



54015F180.DGN WELL NO'S. 3 & 4 OPERATING

FIGURE 4
ALTERNATIVE 4A
WELL NO.2 AND EXTRACTION WELL A
CAPTURE ZONE* AND CTC PLUME AT 120 gpm
CITY OF PERRYTON WELL NO. 2 SITE RI/FS
PERRYTON, TEXAS

options is a matter of months. Neither alternative poses a substantial risk during construction or operation.

6. **Implementability** *considers the technical and administrative feasibility of implementing the alternative, such as relative availability of goods and services.*

Alternatives 1 and 2 are equally implement able since the main components are already in place. The treatment system is easily maintained, and only minor additions to the ground water monitoring well network are necessary for long-term operation. Alternatives 3 and 4 and the three discharge options can also be implemented with existing technology. The administrative feasibility of installing a pipeline to the SGST would require coordination with local utility companies to avoid disrupting service to residents and businesses. The use of ion exchange is a proven treatment method that can be installed at the Site with minimal impacts. The installation of a second extraction well can be performed with locally available labor and materials.

7. **Cost** *includes estimated capital and operation and maintenance costs as well as present worth costs. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.*

The costs to treat and remove the CTC from the ground water is negligible at the various flow rates present in Alternatives 2, 3, and 4. The significant cost increase between the alternatives is due to the additional ground water monitoring and the efforts necessary to discharge the treated water. The highest discharge costs are in Alternatives 3 and 4 where either additional treatment with ion exchange (Option 1), discharge via a pipeline (Option 2), or discharge to constructed lagoons (Option 3) are necessary to handle the higher flow rates of treated water. As a result, the present worth costs increase from $660,606 in Alternative 1 (with no monitoring), to $2,049,926 for Alternative 2 (with monitoring), to $2,868,327 - $3,751,930 for Alternative 3 (monitoring and additional discharge costs), and to $3,439,856 - $5,588,765 for Alternative 4 (higher flow rate than Alternative 3).

8. **State/Support Agency Acceptance** *considers whether the State agrees with U.S. EPA's analyses and recommendations of the RI/FS and the Proposed Plan.*

TNRCC has been provided the opportunity to review the RI/FS reports and Proposed Plan. Its support for the preferred alternative will be evaluated during the public comment period.

9. **Community Acceptance** *considers whether the local community agrees with U.S. EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.*

Community acceptance of the preferred alternative will be evaluated after the public comment period ends and will be described in the ROD for the Site.

SUMMARY OF THE PREFERRED ALTERNATIVE

The preferred remedial alternative for the City of Perryton Well #2 Site is Alternative 4, Expanded Operation of Well No. 2 with Additional Extraction Well and Long Term Monitoring. The preferred alternative for disposal of the treated water is Option 2, diversion to the SGST via a pipeline for blending with water from the municipal supply wells. Alternative 4 will provide the maximum practical control of the contaminant plume and reduce the size of the contaminant plume in the least amount of time. Disposal Option 2 will allow reuse of the treated water and conserve the ground water resource. While Alternatives 2 and 3 would also provide limited or complete source control, Alternative 4 has the added benefit of addressing the maximum extent of the contaminant plume through extraction and treatment and therefore, reducing the overall size of the plume in the least amount of time.

The operation of the expanded pump and treat system is not expected to impact any of the existing private or municipal supply wells. While the use of institutional controls is not included as part of the preferred remedy, a City of Perryton ordinance requires the issuance of a permit for the installation of new wells. This permitting process would provide a mechanism to alert EPA to any changes in the exposure scenario at the Site.

The preferred remedial alternative would constitute the site-wide cleanup strategy and is intended to address fully the threats to human health and the environment posed by the conditions at this Site. Although there were no source materials constituting a principal threat identified at the Site, the preferred alternative also satisfies the statutory mandate for permanence and treatment to the maximum extent practicable. The preferred alternative can change in response to public comment or new information.

GLOSSARY OF TERMS

Specialized terms used in this Proposed Plan are defined below:

Applicable or relevant and appropriate requirements (ARARs) -the Federal and State environmental laws that a selected remedy will meet. These requirements may vary among sites and alternatives.

Atrazine - a widely used herbicide for control of broadleaf and grassy weeds. Atrazine was estimated to be the most heavily used herbicide in the United States in 1987/89, with its most extensive use for corn and soybeans in Illinois, Indiana, Iowa, Kansas, Missouri, Nebraska, Ohio, Texas, and Wisconsin. Label amendments in 1990 reduced the application rates and classified atrazine as a "Restricted Use Pesticide". Effective in 1993, its uses were greatly restricted.

Carbon Tetrachloride - a clear heavy organic liquid with a sweet aromatic odor similar to chloroform. Most of it is used to make chlorofluorocarbon propellants and refrigerants, though this has been declining steadily. Other uses have included: as dry cleaning agent, fire extinguisher, a solvent, and a grain fumigant.

Chloroform - a colorless organic liquid with a sweet odor. Chloroform is a degradation product of carbon tetrachloride.

Contaminant plume - a column of contamination with measurable horizontal and vertical dimensions that is suspended in and moves with ground water.

Ground water - underground water that fill pores in soils or openings in rocks to the point of saturation. Ground water is often used as a source of drinking water via municipal or domestic wells.

Monitoring - ongoing collection of information about the environment that helps gauge the effectiveness of a clean-up action.

Organic compounds - carbon compounds, such as solvents, oils, and pesticides. Most are not readily dissolved in water. Some organic compounds can cause cancer.

Present Worth Analysis - a method of evaluation of expenditures that occur over different time periods. By discounting all costs to a common base year, the costs for different remedial action alternatives can be compared on the basis of a single figure for each alternative. When calculating present worth cost for Superfund sites, total operations & maintenance costs are to be included.

Safe Drinking Water Act Maximum Contaminant Level (SDWA MCL) - the maximum permissible level of a contaminant in water that is delivered to any user of a public water system.

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